



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/813,834	03/22/2001	Jae Sung Roh	0465-0826P	3138

2292 7590 07/11/2003

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

OWENS, DOUGLAS W

ART UNIT PAPER NUMBER

2811

DATE MAILED: 07/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/813,834

Applicant(s)

ROH ET AL.

Examiner

Douglas W Owens

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 7 recites the limitation "...the first impurity region..." in line 5 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by US patent No. 5,547,888 to Yamazaki.

Regarding claims 1 and 5, Yamazaki teaches an asymmetrical semiconductor device, (Fig. 10, for example; see abstract also) comprising:

- a substrate (1) having impurity regions;
- a first and second conductor structure (3,4);

Art Unit: 2811

an insulator structure (8) on the first and second conductor structure and on the substrate except over the substrate in a region between the first and second conductor structures;

sidewall spacers (31a), each sidewall spacer being formed to abut against both a side of the first or second conductor structures and a side of the insulator structure, the sidewall spacers manifesting the self-aligned contact hole in the region between the first and second conductor structures; and

second sidewall spacers (6D) on sides of the first and second conductor structures opposite of the self-aligned contact hole.

Regarding claim 2, Yamazaki teaches a semiconductor device, wherein the first and second conductor structures are gate structures.

Regarding claim 6, Yamazaki teaches a semiconductor device, wherein the ion concentration of a first impurity region is different than the ion concentration of a second impurity region (Col. 8, lines 22 – 25).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 4, and 7 – 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki.

Art Unit: 2811

Regarding claims 4 and 7, Yamazaki teaches a semiconductor device further comprising a contact structure (10S) in the self-aligned contact hole, wherein the contact structure is in contact with the first sidewall spacer and the first impurity region. Yamazaki does not explicitly teach the contact structure is a plug. It is common in the art to form plugs in contact holes for the purpose of providing electrical connection to a node in a substrate. It would have been obvious to one of ordinary skill in the art use a plug since it is a known structure in the art and it is well suited for this use.

Regarding claim 8, Yamazaki does not teach a device, wherein the plug is in contact with a bit line. It would have been obvious to one having ordinary skill in the art to electrically connect the contact plug to a bit line, since the bit line must be in electrical communication with the active devices.

Regarding claim 9, Yamazaki does not teach a device, wherein the contact plug is not disposed directly above the first and second conductor structures. If one having ordinary skill in the art had incorporated the suggested contact plug, it would not have been disposed above the first and second conductive structures since a typical contact plug would not extend out above the conductive structures.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki as applied to claim 1 above, and further in view of US patent No. 5,602,410 to Schwalke et al.

Yamazaki teaches a semiconductor device, wherein the first and second conductor structures comprise:

a gate oxide layer (3); and

a conductive layer (4).

Yamazaki does not teach a cap insulating layer on the conductive layer.

Schwalke et al. teach a gate including a cap insulating layer (Fig. 6; (50)). It would have been obvious to one having ordinary skill in the art to incorporate the teaching of Schwalke et al. into the device taught by Yamazaki since it is desirable to protect the gate from implantation (see Schwalke et al., Col. 4, lines 15 – 20), as well as additional processing steps.

Response to Arguments

9. Applicant's arguments with respect to claims 1 – 9 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W Owens whose telephone number is 703-308-6167. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

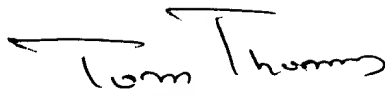
Application/Control Number: 09/813,834

Page 6

Art Unit: 2811

DWO

July 1, 2003


TOM THOMAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800